

REMARKS

By this Amendment, claims 37, 40-41, 43, 49, 77, 84 and 87-91 are amended. Support for the amendments to the claims may be found throughout the detailed description of the present patent application. No new matter is entered. Claims 1-36, 45, 50-76 and 79-83 are withdrawn from consideration as being directed to a non-elected invention. Accordingly, after entry of this Amendment, claims 1-43, 45 and 48-91 will remain pending in the patent application. Reconsideration and allowance of the present patent application based on the foregoing amendments and following remarks are respectfully requested.

Entry of this Amendment is proper under 37 C.F.R. §1.116 as the amendments: (a) place the application in condition for allowance for the reasons discussed herein; (b) do not present any new issues that would require further consideration and/or search as the amendments merely amplify issues discussed throughout the prosecution; (c) do not present any additional claims without canceling a corresponding number of claims; and (d) place the application in better form for appeal, should an appeal be necessary. Entry of this Amendment is thus respectfully requested.

Applicant respectfully notes that claim 89 has not been objected to or rejected by the Examiner in the Office Action. Accordingly, it is respectfully submitted that this claim is in condition for allowance. In the event that claim 89 is not allowed, Applicant respectfully submits that the finality of the Office Action must be withdrawn and a new, non-final Office Action must be issued setting a new period for reply. (See MPEP §706.07).

Claims 37-40, 87-88 and 90-91 were rejected under 35 U.S.C. §112, second paragraph, as allegedly being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. The rejection is respectfully traversed.

In connection with the rejection, the Examiner indicated that the language “are arranged to be decentered” is indefinite. In response, claims 37, 40, 88 and 91 are amended to positively recite that the variable optical-property mirror is arranged to be decentered from a light-incident-side optical axis. Support for the amendment to claims 37, 40, 88 and 91 may be found, for example, in the embodiments of the invention shown in FIGS. 61-67 of the present application. It is respectfully submitted that the claims, as amended, set out and circumscribe the subject matter with a reasonable degree of clarity and particularity, and fully comply with the requirements set forth in MPEP §2171. Accordingly, Applicant respectfully submits that the amendments to claims 37, 40, 88 and 91 overcome the rejection.

The Examiner also indicated that the language “the variable optical-property elements form no array” is indefinite. In response, claims 87-88 and 90-91 are amended to positively recite that the variable optical-property element includes no optical-element array (claims 87 and 91), that the variable optical-property mirror includes no mirror array (claim 90), and that the rotationally asymmetric reflecting surface includes no mirror array (claim 88). It is respectfully submitted that the amendments to claims 87-88 and 90-91 address the rejection fully. Moreover, it is respectfully submitted that one of ordinary skill in the art would readily understand the meaning of mirror array and optical-element array. Therefore, Applicant respectfully submits that the claims, as amended, define the patentable subject matter with a reasonable degree of particularity and distinctness. (*See* MPEP §2173.02).

Accordingly, reconsideration and withdrawal of the rejection of claims 37-40, 87-88 and 90-91 under 35 U.S.C. §112, second paragraph, are respectfully requested.

Claims 37-39 were rejected under 35 U.S.C. §102(b) based on Smither (U.S. Pat. No. 5,004,319). The rejection is respectfully traversed.

Claim 37 is patentable over Smither at least because this claim recites a variable optical-property mirror unit comprising, *inter alia*, a variable optical-property mirror comprising a rotationally asymmetric reflecting surface, a length thereof along a first direction being different from a length thereof along a second direction, wherein the reflecting surface of the variable optical-property mirror reflects visual light and near-infrared light and contributes to forming a two-dimensional image. Support for the amendments to claim 37 may be found, for example, in the embodiments shown in pages 16 and 57 of the detailed description. Smither does not disclose, teach or suggest a variable optical-property mirror unit including these features.

Smither merely discloses a crystal diffraction lens. Smither discloses that a beam 14 from a point source 15 is directed to a face 11 of the crystal 10 and diffracted by a planar spacing 13 to form diffracted beam 20 and line image 21. (*See* FIG. 1 and col. 3, lines 58-60). In Smither, the crystal diffraction lens is an optical element that uses the diffraction phenomenon. Therefore, Smither merely discloses that the diffraction lens is optimized for x-rays and gamma rays. (*See* col. 1, lines 23-24 and col. 3, line 47). However, unlike the invention of claim 37, Applicant respectfully submits that Smither is silent about a reflecting surface of the variable optical-property mirror that reflects visual light and near-infrared light and contributes to forming a two-dimensional image. As such, Smither does not

disclose, teach or suggest each and every feature recited by claim 37 and, as a result, cannot anticipate this claim.

Claims 38-39 are patentable at least by virtue their dependency from claim 37 and for the additional features recited therein.

Accordingly, reconsideration and withdrawal of the rejection of claims 37-39 under 35 U.S.C. §102(b) based on Smither are respectfully requested.

Claim 40 was rejected under 35 U.S.C. §102(e) based on Gelbart (U.S. Pat. No. 6,147,789). The rejection is respectfully traversed.

Claim 40 is patentable over Gelbart at least because this claim recites an optical apparatus comprising, *inter alia*, a variable optical-property mirror having a reflecting surface, a length thereof along a first direction being longer than a length thereof along a second direction, wherein a two-dimensional image is formed by the reflecting surface of the variable optical-property mirror. Gelbart does not disclose, teach or suggest these features.

Gelbart merely discloses a deformable mirror that includes an array of silicon nitride ribbons that are metalized to reflect light. (*See* col. 2, lines 43-61). Gelbart discloses that an image is formed for each individual ribbon. (*See* FIGS. 1a-b). However, in Gelbart, the plurality of ribbons are linearly arranged on a substrate. (*See* FIG. 2 and col. 3, lines 61-63). Therefore, unlike the invention of claim 40, the individual ribbons, collectively, merely form a one-dimensional image. Applicant respectfully submits that Gelbart is silent about an apparatus including a variable optical-property mirror wherein a two-dimensional image is formed by the reflecting surface of the variable optical-property mirror. As such, Gelbart does not disclose, teach or suggest each and every feature recited by claim 40 and, as a result, cannot anticipate claim 40.

Accordingly, reconsideration and withdrawal of the rejection of claim 40 under 35 U.S.C. §102(e) based on Gelbart are respectfully requested.

Claims 41-43, 48-49, 87 and 90 were rejected under 35 U.S.C. §102(b) based on Koyama *et al.* (U.S. Pat. No. 5,793,473) (hereinafter "Koyama"). The rejection is respectfully traversed.

Claim 41 is patentable over Koyama at least because claim 41 recites an optical device comprising, *inter alia*, an optical element having a plurality of rotationally asymmetric surfaces and having a light-deflecting function. Koyama does not disclose, teach or suggest these features.

Koyama merely discloses a lithographic apparatus including a half-prism 4, projections lenses 5 and 17 and a reflecting mirror 6. (*See* FIG. 4). Koyama discloses that the beam is projected onto a surface of the wafer 7 coated with a photoresist material. (*See* description of the third embodiment). Therefore, contrary to what is contended by the Office Action, element 7 does not correspond to “an optical element having a plurality of rotationally assymetric surfaces”, but merely to a semiconductor wafer. Furthermore, Koyama fails to disclose how and where the projection beam propagates after impinging on the wafer 7. Applicant respectfully submits that Koyama is silent about an optical element having a plurality of rotationally asymmetric surfaces and having a light-deflecting function. Therefore, Koyama fails to disclose, teach or suggest each and every feature recited by claim 41 and, as a result, cannot anticipate claim 41.

Claims 42 and 48 are patentable over Koyama at least by virtue of their dependency from claim 41 and for the additional features recited therein.

Independent claims 43, 49, 87 and 90 are patentable over Koyama for at least similar reasons as provided above in claim 41, and for the additional features recited therein. Namely, claim 43 is patentable over Koyama at least because this claim recites an optical system, consisting of, *inter alia*, a rotationally asymmetric surface having a light-deflecting function. Furthermore, claim 49 is patentable over Koyama at least because this claim recites an optical system comprising, *inter alia*, an optical element having a light-deflecting function and disposed at the front side or the back side of the variable optical-property mirror. Likewise, claim 87 is patentable over Koyama at least because this claim recites an optical device comprising, *inter alia*, an optical element having a plurality of rotationally asymmetric surfaces and having a light-deflecting function. Moreover, claim 90 is patentable over Koyama at least because this claim recites an optical system comprising, *inter alia*, an optical element arranged in at least in one of a position in front of the variable optical-property mirror and a position behind the variable optical-property mirror, wherein the optical element has a rotationally asymmetric surface having a light-deflecting function. For at least similar reasons as provided above in claim 41, Koyama fails to disclose, teach or suggest these features. Therefore, Koyama fails to disclose, teach or suggest each and every features recited in independent claims 43, 49, 87 and 90 and, as a result, cannot anticipate claims 43, 49, 87 and 90.

Accordingly, reconsideration and withdrawal of the rejection of claims 41-43, 48-49, 87 and 90 under 35 U.S.C. §102(b) based on Koyama are respectfully requested.

Claims 77-78 and 91 were rejected under 35 U.S.C. §102(b) based on Pepper (U.S. Pat. No. 5,046,824). The rejection is respectfully traversed.

Claim 77 is patentable over Pepper at least because this claim recites an optical apparatus, comprising, *inter alia*, a plurality of variable optical-property elements, wherein each of the variable optical-property elements has an optical surface, a shape of the optical surface being changeable. Pepper fails to disclose, teach or suggest an optical apparatus including these features.

Pepper merely discloses an apparatus including a liquid crystal light valves 2, 8 and 14 that comprises a liquid crystal layer and a photoconductive substrate layer. (See FIG. 1 and col. 3, lines 54-56). Pepper discloses that the beam 20 passes through liquid crystal layer 4 and is reflected at the mirror interface between the photoconductive substrate (PC) 6 and LC 4 as a first reflected beam. (See col. 3, lines 63-68). However, unlike the invention of claim 77, Pepper is silent about an optical apparatus wherein each of the variable optical-property elements has an optical surface, a shape of the optical surface being changeable. Specifically, Pepper fails to disclose, teach or suggest that a front surface of the liquid crystal layer 4 and the mirror surface between the liquid crystal layer 4 and the photoconductive layer 6 are changeable. As such, Applicant respectfully submits that Pepper does not disclose, teach or suggest each and every feature recited by claim 77 and, as a result, cannot anticipate claim 77.

Claim 78 is patentable over Pepper at least by virtue of its dependency from claim 77 and for the additional features recited therein.

Claim 91 is patentable over Pepper at least because this claim recites an optical apparatus comprising, *inter alia*, a plurality of variable optical-property elements, wherein each of the variable optical-property elements has an optical surface, a shape of the optical surface being changeable. For similar reasons as provided above in claim 77, Applicant respectfully submits that Pepper fails to disclose, teach or suggest an optical apparatus including these features. Therefore, Pepper fails to disclose, teach or suggest each and every feature recited by claim 91 and, as a result, cannot anticipate claim 91.

Accordingly, reconsideration and withdrawal of the rejection of claims 77-78 and 91 under 35 U.S.C. §102(b) based on Pepper are respectfully requested.

Claims 84-85 and 88 were rejected under 35 U.S.C. §102(b) based on Molstrom (U.S. Pat. No. 3,923,370). The rejection is respectfully traversed.

Claim 84 is patentable over Molstrom at least because this claim recites an optical device constantly comprising, *inter alia*, a variable optical-property element; and a rotationally asymmetric reflecting surface. Molstrom does not disclose, teach or suggest an optical device including these features.

Molstrom discloses an optical system for a head mounted display. (See FIG. 2). Molstrom discloses that this optical system has a plurality of reflecting surfaces (areas 20, 30, mirror 24). In Molstrom, light reflected by the plurality of reflecting surfaces is incident on the eye of the pilot. The Examiner interpreted the eye of the pilot as being a variable optical-property element. (See page 9 of the Office Action). However, Applicant respectfully notes that the eye of the pilot is disposed in the head mounted display only when the head mounted display is in use. Therefore, the eye of the pilot is not part of the head mounted display. As a result, Applicant respectfully submits that Molstrom is silent about an optical device constantly comprising, *inter alia*, a variable optical-property element; and a rotationally asymmetric reflecting surface. Therefore, Molstrom does not disclose, teach or suggest each and every feature recited by claim 84 and, as a result, cannot anticipate claim 84.

Claim 85 is patentable over Molstrom at least by virtue of its dependency from claim 84 and for the additional features recited therein.

Claim 88 is patentable over Molstrom for at least similar reasons as provided above in claim 84 and for the additional features recited therein. Namely, claim 88 is patentable over Molstrom at least because this claim recites an optical apparatus constantly comprising, *inter alia*, a variable optical-property element, and an optical element having a rotationally asymmetric reflecting surface. As mentioned previously, Molstrom does not disclose, teach or suggest these features. Therefore, Molstrom does not disclose, teach or suggest each and every feature recited by claim 88 and, as a result, cannot anticipate claim 88.

Accordingly, reconsideration and withdrawal of the rejection of claims 84-85 and 88 under 35 U.S.C. §102(b) based on Molstrom are respectfully requested.

Claims 41, 43, 84, 86 and 88 were rejected under 35 U.S.C. §102(b) based on Rambauske (U.S. Pat. No. 3,950,079). The rejection is respectfully traversed.

Claim 41 is patentable over Rambauske at least because this claim recites an optical device comprising, *inter alia*, a variable optical-property element, wherein the variable optical-property element has an optical surface, a light-deflecting function of the optical surface itself being changeable. Rambauske does not disclose, teach or suggest an optical element including these features.

Rambauske merely discloses a catoptric arrangement including a plurality of mirrors 12, 14, 16 and 18. (See FIG. 1). However, in Rambauske, the surface of each of the mirrors 12, 14, 16 and 18 has a constant light-deflecting function. Rambauske is silent about a variable optical-property element that has an optical surface, a light-deflecting function of the optical surface itself being changeable. As such, Rambauske does not disclose, teach or suggest each and every feature recited by claim 41 and, as a result, cannot anticipate claim 41.

Claim 43 is patentable over Rambauske for at least similar reasons as provided above in claim 41 and for the additional features recited therein. Namely, claim 43 is patentable over Rambauske at least because this claim recites an optical system, consisting of, *inter alia*, a variable optical-property mirror, wherein the variable optical-property mirror has an optical surface, a light-deflecting function of the optical surface itself being changeable. Rambauske does not disclose, teach or suggest an optical system including these features. Therefore, Rambauske does not disclose, teach or suggest each and every feature recited by claim 43 and, as a result, cannot anticipate claim 43.

Similarly, claim 84 is patentable over Rambauske for at least similar reasons as provided above in claim 41 and for the additional features recited therein. Namely, claim 84 is patentable over Rambauske at least because this claim recites an optical device constantly comprising, *inter alia*, a variable optical-property element, wherein the variable optical-property element has an optical surface, a light-deflecting function of the optical surface itself being changeable. Rambauske does not disclose, teach or suggest an optical device including these features. Therefore, Rambauske does not disclose, teach or suggest each and every feature recited by claim 84 and, as a result, cannot anticipate claim 84.

Claim 86 is patentable over Rambauske at least by virtue of its dependency from claim 84 and for the additional features recited therein.

Likewise, claim 88 is patentable over Rambauske for at least similar reasons as provided above in claim 41 and for the additional features recited therein. Namely, claim 88 is patentable over Rambauske at least because this claim recites an optical apparatus constantly comprising, *inter alia*, a variable optical-property element, wherein the variable optical-property element has an optical surface, a light-deflecting function of the optical surface itself being changeable. Rambauske does not disclose, teach or suggest an optical device including these features. Therefore, Rambauske does not disclose, teach or suggest each and every feature recited by claim 88 and, as a result, cannot anticipate claim 88.

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Accordingly, reconsideration and withdrawal of the rejection of claims 41, 43, 84, 86 and 88 under 35 U.S.C. §102(b) based on Rambauske are respectfully requested.

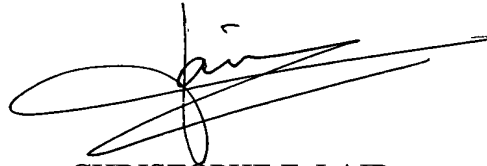
Applicant has addressed the Examiner's rejections and respectfully submits that the application is in condition for allowance. A notice to that effect is earnestly solicited.

If any point remains in issue which the Examiner feels may be best resolved through a personal or telephone interview, please contact the undersigned at the telephone number listed below.

Please charge any fees associated with the submission of this paper to Deposit Account Number 033975. The Commissioner for Patents is also authorized to credit any over payments to the above-referenced Deposit Account.

Respectfully submitted,

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A handwritten signature in black ink, appearing to read 'C. Lair', with a large, stylized loop at the end.

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